Effects of various stabilization techniques on the nutritional quality and antioxidant potential of brewer's rice

ABSTRACT

Brewer's rice is a nutritionally rich by-product of rice milling industries but remained unutilized due to its high susceptibility to lipid oxidation. Thus, it is desirable to develop certain strategies to stabilize the brewer's rice for food application. In the present study, the effects of microwave heating, gamma irradiation, and chemical (hydrochloric acid) treatments in stabilizing brewer's rice were investigated. Result showed that microwave-heated brewer's rice contained lower FFA content as compared with control and irradiation. However, FFA content in brewer's rice increased significantly ($p < 0.05$) during storage for all methods, except for hydrochloric acid (HCl) treatment. All the stabilizations methods showed non-significant ($p < 0.05$) effect on protein, fat, and ash content. However, microwave and chemical treatment significantly ($p < 0.05$) reduced moisture content. All methods showed no significant ($p < 0.05$) reduction on phenolic contents but significantly ($p < 0.05$) reduced the γ-oryzanol and α-tocopherol contents. Microwave heating was able to reduce the oxidation of brewer's rice without affecting other bioactive molecules present in brewer's rice. Therefore, microwave heating can be considered as the most suitable technique for stabilizing brewer's rice.

Keyword: Brewer's rice; Oxidation; Microwave heating; γ-Irradiation; Chemical treatment; Antioxidant compounds